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ABSTRACT

This report focuses on the achievement in basic skill areas attained by disadvantaged students in compensatory activities. Areas reported on include corrective reading and mathematics. An overview of the report's purpose and methodologies indicates that reading and mathematics achievement data were collected for Title I participants on norm referenced measures. Data collected are presented in tables and graphs for reading and mathematics achievement in both private and public upstate New York and New York City schools. Comparisons of the data presented indicate that participation of disadvantaged students in Title I programs kept them from falling behind and even helped them catch up to their more advantaged peers. In light of the findings, this report lists aspects of the program that contributed to the apparent growth of educationally disadvantaged youngsters in project activities. Detailed descriptions of each of the projects evaluated are included. (EB)

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ELEMENTARY AND SECONDARY EDUCATION
ACT OF 1965 - TITLE I
P.L. 93-380

THE NEW YORK STATE ANNUAL EVALUATION REPORT

FOR 1976-77 FISCAL YEAR

ACHIEVEMENT SUMMARY

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FOREWORD

The 1976-77 Annual ESEA, Title I Report conforms to requirements set forth by the U.S. Office of Education by providing an annual summary of the Title I efforts in New York State. 1/ The report provides an overview of achievement in supplementary reading and mathematics.

Statistical tables were constructed by Robert Miller. The section on promising activities was contributed by George Cronk. Primary responsibility for the report was held by Eileen Kelly. The report was prepared in the Office of Elementary, Secondary and Continuing Education, Research and Planning for the Office of Federal Education Opportunity Programs.

1/ "ESEA, Title I Program Information #341 DCE/PBS" in accordance with PL 89-10 as amended by PL 93-380, Part D, General Provisions, Section 142 (a) (3).

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CHAPTER 1

OVERVIEW

The 1976-77 Annual ESEA, Title I Report focuses on the achievement in basic skill areas attained by participants in compensatory activities. New York State has established the priority areas of corrective reading and mathematics, and the use of bilingual metodology in corrective reading and mathematics for these participants.

The data are summative with reference to demonstrated changes in pupil behavior as assessed largely by standardized measures, usually collected from paper and pencil, pupil recorded responses.

Purpose of the Report

The achievement summary was prepared to provide decision makers at local, State and Federal levels with a source of information bearing directly on probable outcomes of compensatory efforts in the education of disadvantaged pupils. This report fulfills the Federal mandate for an annual evaluation summary of ESEA, Title I funded activities.

For purposes of obtaining comparable achievement data for which defensible conclusions might be drawn, districts were confined to reporting data from (1) cognitively oriented behavioral objectives, (2) comparable instruments that met requirements of empirically derived standardization, (3) analyses that involved statistical checks to reduce errors associated with measurement and (4) pupils who had a set of paired scores. These parameters, which were agreed upon before projects were funded, permitted the aggregation of similar data for certain statewide conclusions regarding the effectiveness of ESEA, Title I funded compensatory activities.

Procedures

Each of the projects included behavioral objectives, a schedule of data collection on specified measurement devices and a plan of data analysis. The summary of data in this report required a set of procedures that would encompass many varied objectives, tests, plans of data collection and analysis.

Objectives

District-prepared behavioral objectives indicate the area of behavioral change (e. g., reading comprehension), the degree of change anticipated at the conclusion of the treatments (e. g., an increase of nine months in grade equivalent units), and the criterion measure for reference (e. g., the Metropolitan Achievement Reading Comprehension subtests). Where appropriate, the State superimposed the following question so that comparable data leading to programwide inferenced using norm-referenced tests could be examined: Did each treatment group in each priority area demonstrate achievement beyond expectation (based on past performance) when measured by a norm-referenced achievement test? Some districts translated this question directly into a performance objective specific to a subject matter area.

Parameters of District-Reported Data

Since many types of observations of behavior are available to district evaluators, a set of boundaries of data to be summarized and reported is necessary. Only measures that were standardized were permitted at the time each local ESEA, Title I application for a project grant was approved. The scores were usually transformed into grade equivalent units, standard or scaled scores, or percentile ranks for reporting data to the State. An estimated group level of performance based upon the absence of ESEA, Title I intervention was requested of districts wherever reasonable. Conclusions allowable from district norm-referenced data were limited to those that were logically connected to results of district-conducted inferential statistical analysis. Where districts employed norm-referenced tests, but too few pupils were available for a feasible inferential statistical analysis to be conducted, individual standard or scaled scores were reported. In all cases, only the scores for pupils who had taken both a pretest and posttest were submitted. Given the mobility and chronic absenteeism peculiar to the target population in the larger metropolitan areas hosting ESEA, Title I services, about twenty-five percent of the project participants are not reflected in the summary of achievement data.

Instrumentation

A pupil's score taken from a norm-referenced test (where test items were selected for their ability to discriminate between pupils) permits evaluators to assess a pupil's achievement relative to other pupils in the original norming population. Where appropriate, districts were encouraged to select a reading measurement device from the Anchor Series, a set of devices endorsed by the United States Office of Education as meeting vigorous standardization criteria as well as yielding scores convertible to the 1970 Metropolitan Achievement Reading Tests. The norm-referenced measures in the ESEA, Title I program were taken from devices that met accepted conditions of reliability and validity.

The State reporting procedures had to be sufficiently comprehensive to accept data from different devices administered to differing subpopulations from treatments with a wide range of exposure to supplementary activities. The data reduction procedures, therefore, had to accommodate the wide range of factors associated with ESEA, Title I supplementary services.

Data Aggregation

Data were subjected to a series of editing operations in preparation for statewide summaries. At the conclusion of the projects, districts submitted the Mailed Evaluation Report which contained the norm-referenced data. The data collection form is on file in the Bureau of School and Categorical Programs Evaluation. Data were first screened for completeness, reasonableness among possible acceptable responses by data unit (kind), and reasonableness within expected limits (amount or degree). The surviving data were prepared in a machine readable form. The data were then segregated into reading and mathematics objective-based categories. Additionally, norm-referenced data from New York City were treated separately. Further groupings were obtained by separating data by grade levels. The group data were also sorted as to the score type reported.

Methods of Analysis

Norm-referenced group data were analyzed for differences between two distributions (pretest to posttest or predicted posttest to obtained posttest) as determined by the probability levels associated with the statistics. For those groups that demonstrated achievement (at the predetermined level of confidence) the means were averaged (by weighted means) to obtain a mean that represented accomplishment in that subject matter area for a specific grade interval. Where norm-referenced data were confounded by potential regression to the mean effects, they were not included in the major aggregations. The summaries for grouped norm-referenced data were developed for each score type reported. The final operation for the main portion of this report involved reducing the rates of change in behavior to one common base (growth per month) for the comparison of achievement with and without ESEA, Title I activities. Other analyses involved the segregation of treatments according to the months elapsing between pretest and posttest administrations.

Limitations

The several procedures for preparing the achievement summary had to be sufficiently sound to yield defensible findings while still being flexible enough to accommodate various objectives, various measurement devices, different subpopulations, various score types, and several different data analysis techniques. Furthermore, the reduction of data for a summary tends to conceal specific effects at particular grade levels in a given subject matter area. Data were deleted or segregated when it was determined that an unauthorized change in the implementation or a district evaluation plan might have influenced the findings.

It should be noted that there are features of the procedures applied to the data in this report which could also produce a tendency to overestimate the effeciveness of the categorically aided compensatory education programs. However, many experts feel that no one factor would be expected to produce positive findings of the strength observed, and the possibility that all such factors had combined in their most extreme form to produce such apparently factorable results (where none had really occurred) seems very remote.

The data reported herein survived several rigorous procedures of aggregation which indicate that educationally disadvantaged project participants were diminishing the distance between themselves and the norms by which they were being judged.

CHAPTER II

READING ACHIEVEMENT

Reading achievement data were collected for Title I participants on norm-referenced measures. Scores collected on norm-referenced devices permitted comparisons of treatment group means to the norming population. Since Title I participants generally were in the lowest tail of a grade level distribution, the goal of remedial reading efforts was to raise the group upward toward the mid point (50th percentile) of the distribution.

Pupils participating in ESEA, Title I projects received supplementary treatments in remedial reading for varying lengths of time across the school year. Different commercially prepared standardized devices were administered before and after the treatments in different districts. Most data for grades two and above were reported in grade equivalent units.

Since different time periods elapsed between pretest and posttest administrations, all grade equivalent scores were translated into the target groups' rates of gain per month. The data were analyzed as a comparison between pupil achievement prior to the Title I treatment intervention and achievement at the conclusion of the remedial treatment. This method does not account for inflation of the rate for pupils who participated in prior years of treatment. The impact of the reported treatments is slightly depressed by such participants. The pupil's past perfromance becomes his own "matched" control paired performance with this scheme. 1/

The data in tables 1 and 2 reveal that the means for over 49,000 upstate public and nonpublic school tested participants in treatments lasting over three months indicated achievement ranging from 1.18 to 2.26 months growth for each month of participation in ESEA, Title I projects.

The rates of gain in grade equivalent units for pupils were derived by the State from pretest and posttest means submitted by local districts. The hypothetical rate of gain without supplementary ESEA, Title I treatment was computed. The rates for the participant groups in table 1, measured in grade equivalent units, indicate that the successful upstate public school pupils improved at a rate greater than that of the average learner (i. e., one month's growth for each month of instruction). The combined group mean indicates that these tested groups were coming closer to their more advantaged peers at a rate of over .46 month per month of ESEA, Title I treatment.

1/ Actually, the local education agencies use the rates of gain to predict a posttest mean in the absence of treatment, compare the obtained mean at the end of the treatment, and test the differences via a correlated t-ratio or analysis of variance statistic.

Table 1

Upstate Public School Reading Achievement

Grade Level	Participants		Monthly Rate	Monthly Rate
	Treated	Tested	Before Treatment	During Treatment
2	9,176	8,148	.58	1.26
3	10,079	9,198	.55	1.18
4	10,210	9,234	.38	1.89
5	9,502	8,632	.59	1.36
6	310	300	.62	1.71
7	1,277	1,161	.44	1.38
8	4,862	4,382	.60	1.57
9	2,830	2,414	.58	1.64
10	1,119	991	.58	1.58
11	351	288	.59	1.40
12	224	181	.56	1.41
Total	49,940	44,929	.53	1.46

Like the upstate public data, the change in upstate nonpublic participant group means, measured in grade equivalent units, indicated success. Monthly rates during treatment ranged from 1.27 to 2.26 with a combined group mean of 1.89. Thus, these learners showed a monthly gain of .89 beyond the 1.00 associated with the normal rate of growth. Table 2 below depicts the growth rate by grade level.

Table 2

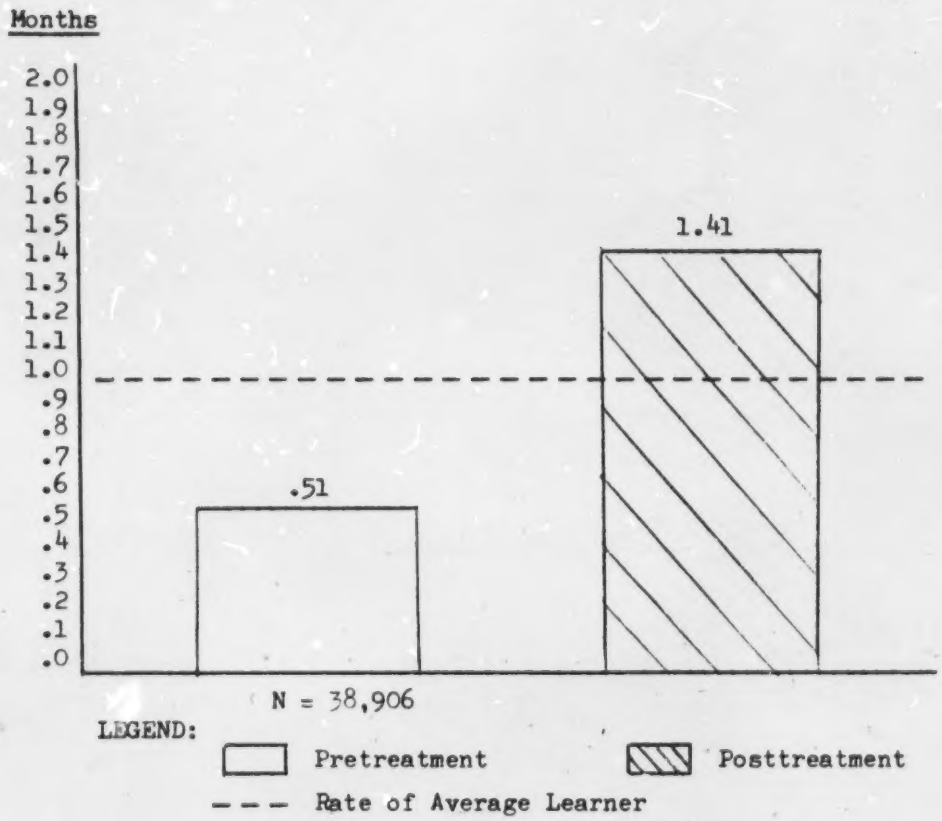
Upstate Nonpublic School Reading Achievement

Grade Level	Participants		Monthly Rate	Monthly Rate
	Treated	Tested	Before Treatment	During Treatment
2	882	712	.58	1.34
3	909	814	.60	1.43
4	739	683	.56	1.43
5	722	652	.49	2.08
6	623	572	.60	1.38
7	325	292	.67	1.81
8	301	275	.59	1.98
9	102	97	.64	1.68
10	75	68	.86	1.38
11	11	10	.41	1.27
12	12	6	.64	2.26
TOTAL	4,701	4,142	.58	1.89

The combined public and nonpublic group means for 49,071 upstate pupils tested (of 54,641 participants treated) indicated a growth of over 1.49 months for every month of Title I treatment. This rate is greater than the established rate of the average learners, that is, one month growth for each month of instruction. The grade equivalent rates prior to Title I intervention and during intervention are displayed in illustrations 1 and 2.

Illustration 1

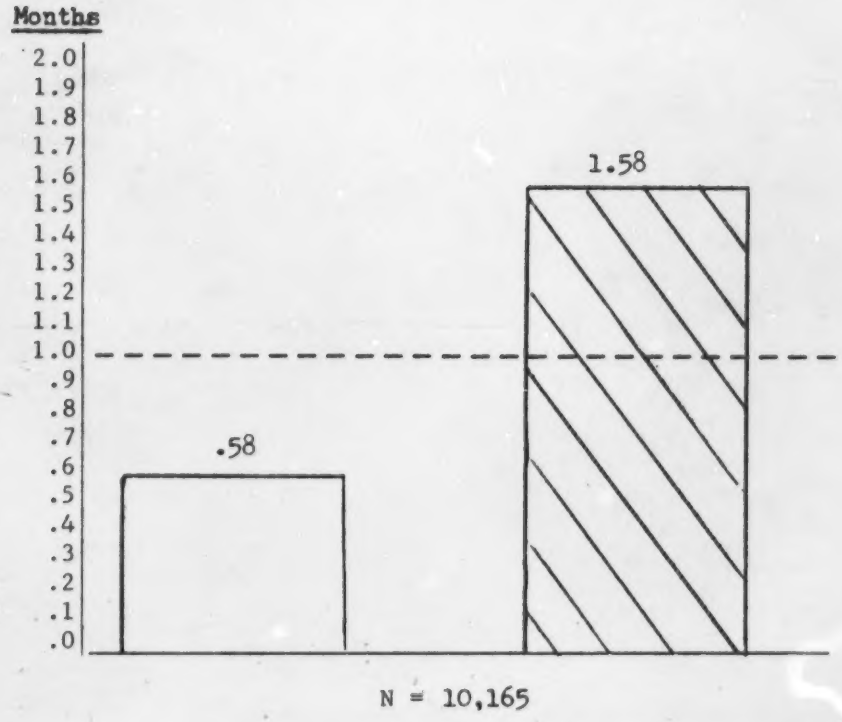
Upstate Elementary Reading
Combined Public and Nonpublic Groups Rate of Gain
Grades 2-6



Prior to ESEA Title I intervention, the target population had been falling behind at a rate of about one-half month for each month of classroom activity. During treatment the upstate elementary reading population, by tripling their rate of gain, surpassed the average learner's rate of gain.

Illustration 2

Upstate Secondary Reading Combined Public and Nonpublic Groups Rate of Gain Grades 7-12



The greater rate of the comined public and nonpublic upstate secondary pupil groups showed an even greater improvement, as displayed in illustration 2, than the elementary rate indicated. The secondary pupils' mean rate of gain indicated that the Title I participant groups were catching up with their nondisadvantaged peers at a rate of 1½ months for each month of treatment.

As indicated in tables 3 and 4, the mean achievement rates for over 95,000 New York City public and nonpublic pupils participating in reading treatments lasting more than three months ranged from .83 to 4.50 months growth for each month of ESEA Title I treatment. The comparison of rates for New York City elementary and secondary pupils prior to Title I treatment and during treatment are displayed in illustrations 3 and 4.

Table 3

New York City Public School
Reading Achievement

Grade Interval	Participants		Monthly Rate	Monthly Rate
	Treated	Tested	Before Treatment	During Treatment
2	6,356	5,393	.50	.98
3	9,941	8,498	.40	1.00
4	11,261	10,001	.48	1.09
5	10,881	9,773	.51	1.22
6	10,093	8,995	.55	1.18
7	7,458	6,109	.56	1.21
8	7,967	6,684	.54	1.45
9	13,383	10,475	.54	1.07
10	11,533	9,212	.52	1.05
11	8,463	7,047	.50	1.09
12	[illegible],327	4,749	.50	1.24
TOTAL	102,663	86,936	.51	1.14

The target population in New York City public schools achieved at a rate of about ½ month for each month of regular classroom experiences. During the ESEA, Title I treatments the target population more than doubled the rate, achieving 1.14 months in grade equivalent units.

Table 4

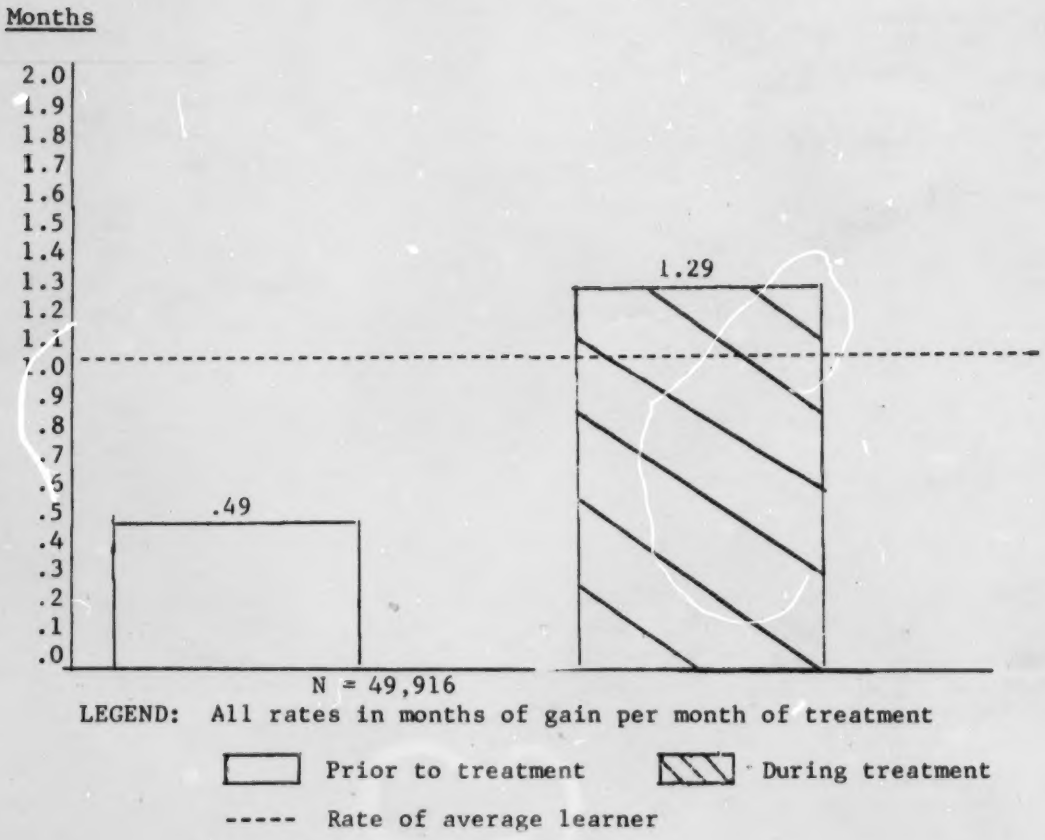
New York City Nonpublic Reading Achievement

Grade Interval	Participants		Monthly Rate	Monthly Rate
	Treated	Tested	Before Treatment	During Treatment
2	1,020	950	.57	1.59
3	1,597	1,531	.49	.97
4	1,699	1,658	.49	.83
5	1,755	1,708	.47	1.23
6	1,439	1,409	.48	1.09
7	849	822	.46	1.09
8	548	529	.46	1.18
9	88	81	.49	1.08
10	46	43	.41	1.51
11	15	13	.67	4.50
TOTAL	9,056	8,744	.49	1.19

The rates for the New York City participant groups above, measured in grade equivalent units, indicate that the successful nonpublic pupils improved at a rate greater than that of the average learner (i. e., one month's growth for each month of instruction). The rate of achievement of nonpublic school pupils in New York City projects was raised from .49 for each month of regular classroom activity to a rate in excess of one month for each month of Title I supplementary services.

Illustration 3

New York City Elementary Reading
Combined Public and Nonpublic Rate of Gain
Grades 2-6



The bars in illustration 3 indicates that New York City elementary pupils who achieved at a rate of less than one half month for each month of classroom activities prior to the intervention of ESEA Title I had ceased falling further behind and had begun to reduce the gap between themselves and their more advantaged peers.

Illustration 4

New York City Secondary Reading
Combined Public and Nonpublic Rate of Gain
Grades 7-12

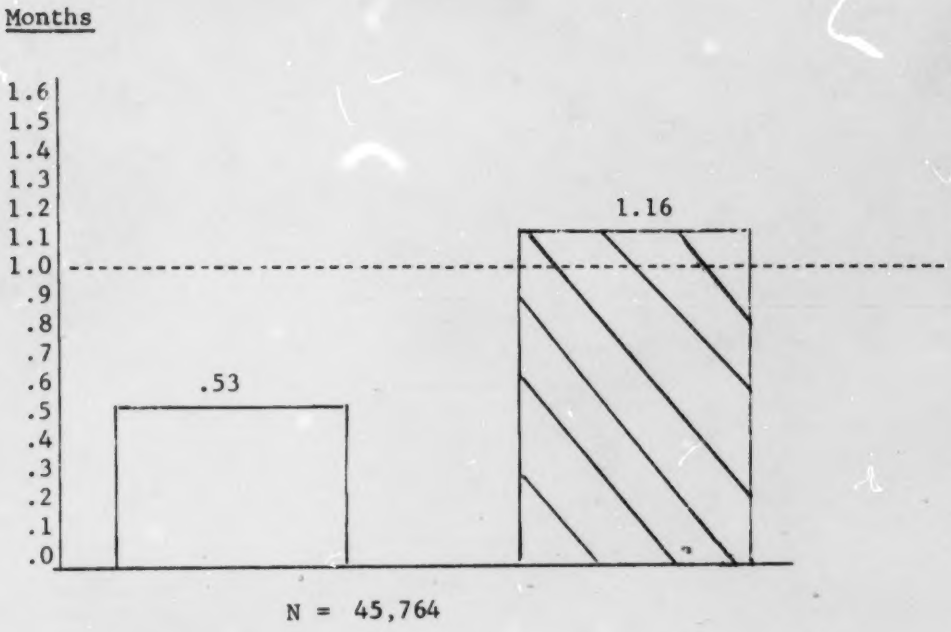


Illustration 4 depicts the combined public and nonpublic rate of gain for secondary students in New York City. Prior to treatment, their achievement rate was a little over ½ month for each month of classroom activities. During treatment, pupils achieved at a rate of 1.16 months for each month of schooling.

The success of close to 49,000 upstate and 96,000 New York City tested pupils in treatments lasting more than three months, as measured by norm-referenced reading achievement tests, indicated that most districts were not only able to keep the pupils from falling further behind but also were able to help these elementary and secondary target populations catch up to their more advantaged peers.

CHAPTER III

MATHEMATICS ACHIEVEMENT

Mathematics achievement data were collected on norm-referenced devices in the same fashion described for reading treatments. Approximately 24,000 Upstate and 43,000 New York City project participants received instruction in mathematics. For purposes of analysis, project group means were segregated as to (1) the source of the data (public vs. nonpublic) and (2) the inclusion of a prediction of growth in the absence of ESEA Title I supplementary treatment.

The mathematics achievement data obtained from norm-referenced tests are reported in tables 5 and 6 for Upstate districts by grade level. The group grade equivalent aggregated means indicate that over 21,000 Upstate public and nonpublic school participants achieved a growth rate significantly greater than the expected gain without ESEA Title I treatment. Illustrations 5 and 6 depict the rate of growth for successful Upstate elementary and secondary participants. The pretreatment and posttreatment rates of gain were quite similar for elementary and secondary groups.

Table 5

Upstate Public School Mathematics Achievement

Grade Interval	Participants		Monthly Rate	Monthly Rate
	Treated	Tested	Before Treatment	During Treatment
2	2,506	2,132	.58	1.14
3	3,668	3,286	.60	1.38
4	4,052	3,539	.63	1.48
5	3,728	3,376	.65	1.53
6	3,014	2,684	.63	1.73
7	2,340	2,094	.64	1.53
8	1,786	1,612	.60	1.83
9	432	401	.65	1.88
10	190	173	.60	2.04
11	46	35	.54	2.25
12	45	28	.49	2.07
TOTAL	21,807	19,360	.62	1.52

Prior to the ESEA Title I intervention, roughly 22,000 upstate public school participants were averaging .62 months gain for each month of regular school participation, while their more advantaged peers gained one month of schooling. The data in table 6 indicate that not only had the target population ceased falling behind, but in addition to gaining a month for a month, were recovering the distance at a rate of .52 month in grade equivalent units for each month of Title I participation.

Table 6

Upstate Nonpublic School Mathematics Achievement

Grade Interval	Participants		Monthly Rate	Monthly Rate
	Treated	Tested	Before Treatment	During Treatment
2	183	148	.26	1.40
3	483	352	.60	1.67
4	384	358	.93	1.21
5	351	331	1.52	1.09
6	307	288	.07	1.34
7	189	179	.07	1.72
8	126	124	.69	1.86
9	13	13	.08	.09
10	6	6	.07	.09
TOTAL	2,042	1,799	.84	1.40

Upstate nonpublic school mathematics participants tended to achieve about .84 month for each month of regular classroom instruction prior to ESEA Title I intervention. During treatment, the same 1,799 pupils achieved about 1.40 months for each month of instruction. The pupils were closing the gap between themselves and their more advantaged peers at a rate of 2/5 months in grade equivalent units for each month of instruction.

Illustration 5

Upstate Elementary Mathematics Combined Public
and Nonpublic Rate of Gain
Grade 2-6

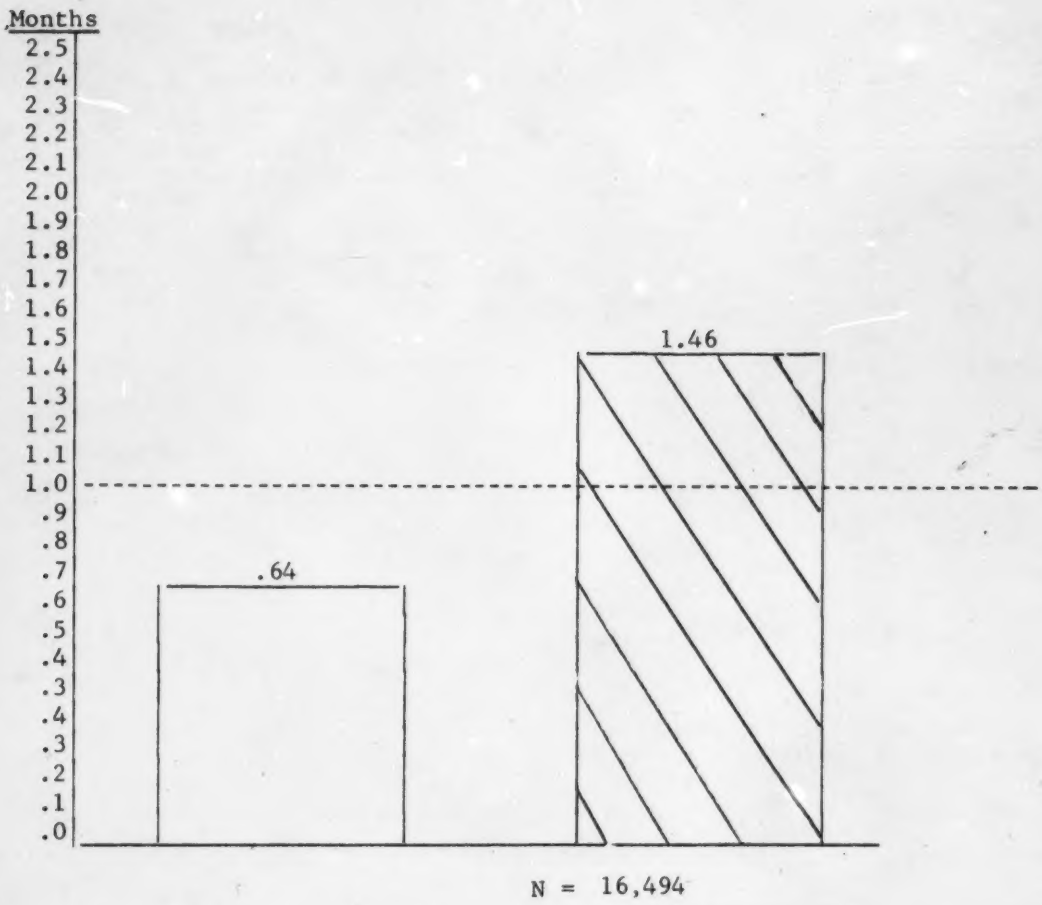
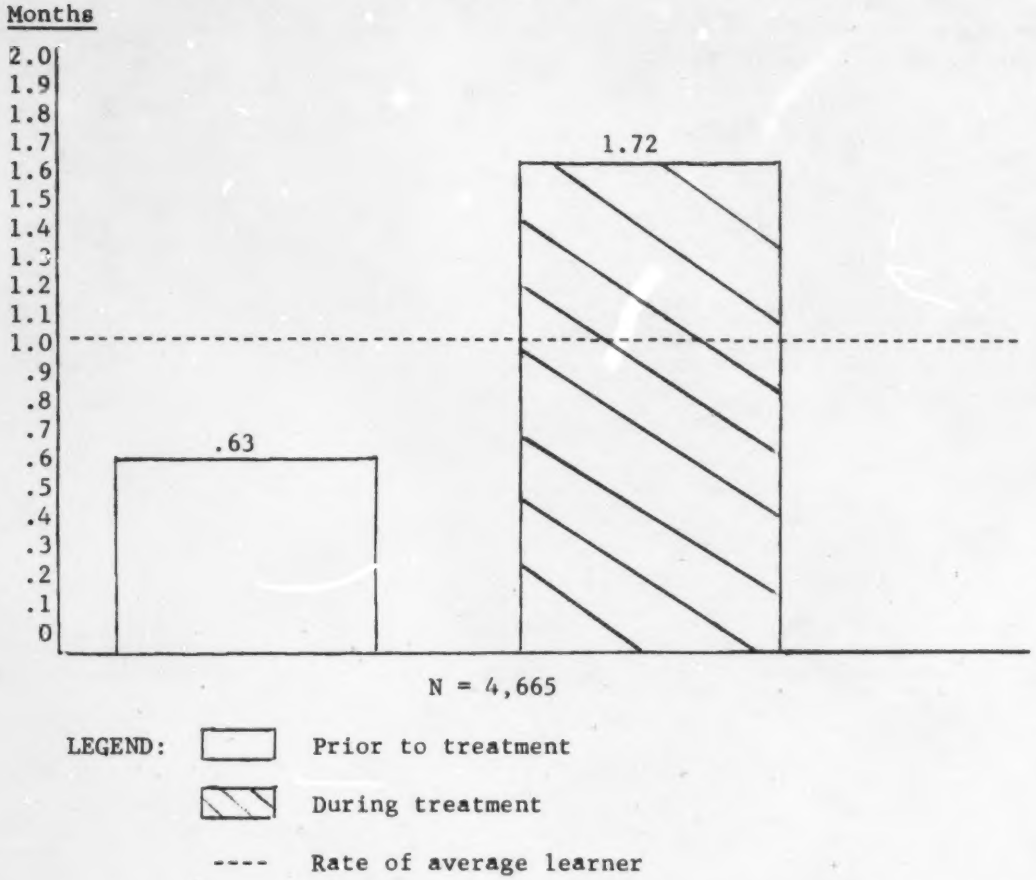


Illustration 5 displays the comparison between the pretreatment rate of gain, .64, and the posttreatment growth rate, 1.46, for upstate elementary mathematics groups. The graph also shows that the mean rate of gain upon the conclusion of Title I treatment was .46 month greater than the normal rate.

About 4,700 upstate secondary students were achieving at a rate of slightly over .63 month for each month of school activities prior to Title I intervention. During treatment the target population not only gained a month for each month of ESEA Title I treatment but also the target group gained an additional .72 months. Illustration 6 depicts the contrasting growth rates.

Illustration 6

Upstate Secondary Mathematics Combined Public and Nonpublic Groups Rate of Gain Grades 7-12



Where upstate remedial mathematics pupils had been achieving about .64 month's growth prior to ESEA Title I intervention, the norm-referenced tests indicated growth for both elementary and secondary students at 1.51 months or better for each month of supplementary services. Such students were closing the gap between themselves and their more advantaged peers at a rate of about .49 month for each month of exposure to Title I services.

The New York City total mathematics test scores obtained from participants tested with norm-referenced devices indicated similar success (see tables 7 and 8). The combined public and nonpublic group means suggest that participants, who began the program with a rate of growth of less than one month (about .7 or less) per month of instruction, were achieving at a rate of more than one month (nearly 1.48 months per month) of Title I treatment.

Table 7

New York City Public School
Mathematics Achievement

Grade Interval	Participants		Monthly Rate	Monthly Rate
	Treated	Tested	Before Treatment	During Treatment
2	2,858	2,458	.42	1.15
3	4,928	4,378	.44	1.21
4	5,920	5,223	.50	1.26
5	6,336	5,724	.54	1.48
6	4,879	4,147	.56	1.33
7	2,731	2,353	.61	1.36
8	2,186	1,954	.58	1.18
9	3,618	2,775	.64	2.04
10	2,584	2,113	.60	1.92
11	889	728	.55	1.65
12	193	186	.53	1.69
TOTAL	37,122	32,039	.53	1.43

Table 8

New York City Nonpublic School
Mathematics Achievement

	Participants		Monthly Rate	Monthly Rate
	Treated	Tested	Before Treatment	During Treatment
2	869	798	.45	1.25
3	1,233	1,136	.51	1.88
4	1,122	1,018	.61	1.61
5	946	923	.65	1.66
6	888	857	.64	1.59
7	519	519	.60	2.04
8	246	238	.66	1.21
TOTAL	5,823	5,489	.58	1.64

Nearly 7,300 pupils from nonpublic schools had established a rate of gain of about 2/3 month for each month of regular school activities prior to ESEA Title I intervention. During the compensatory activities, the same population averaged 1½ months growth in grade equivalent units for each month of participation.

After the supplemental services, participants in elementary and secondary grades were catching up to the average learner, as depicted in Illustrations 7 and 8.

Illustration 7

New York City Elementary Mathematics
Combined Public and Nonpublic Groups Rate of Gain
Grades 2-6

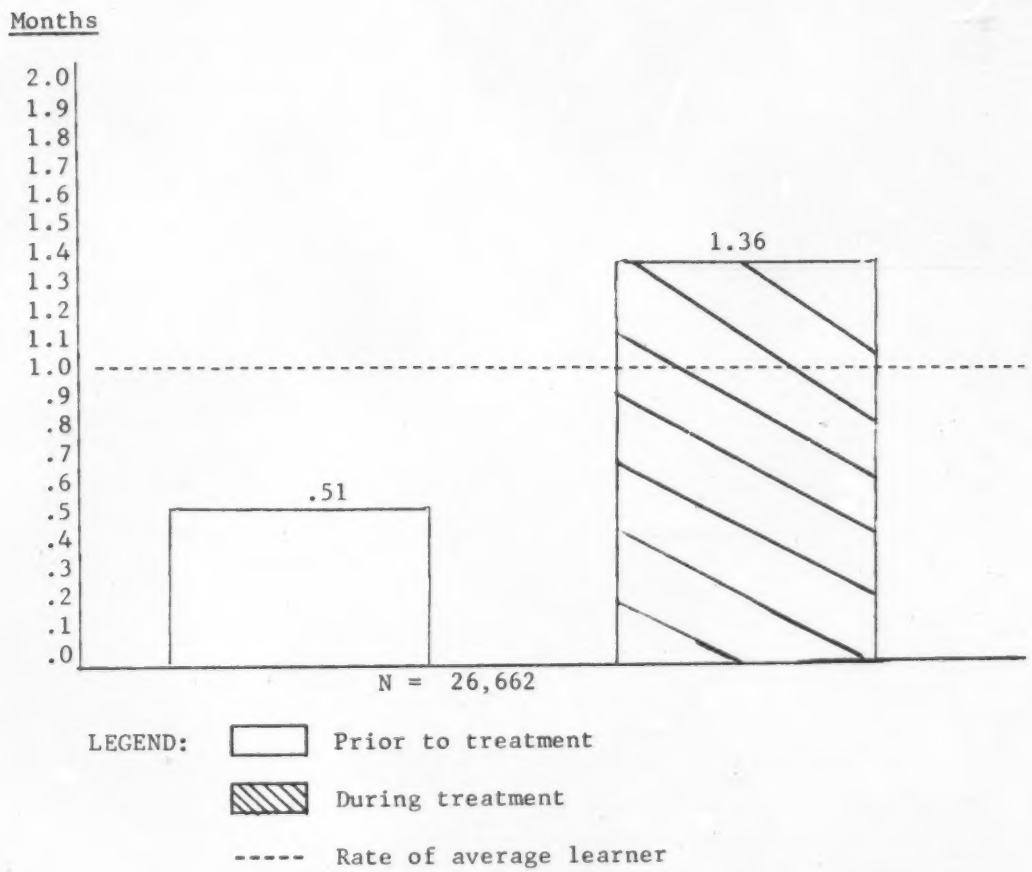
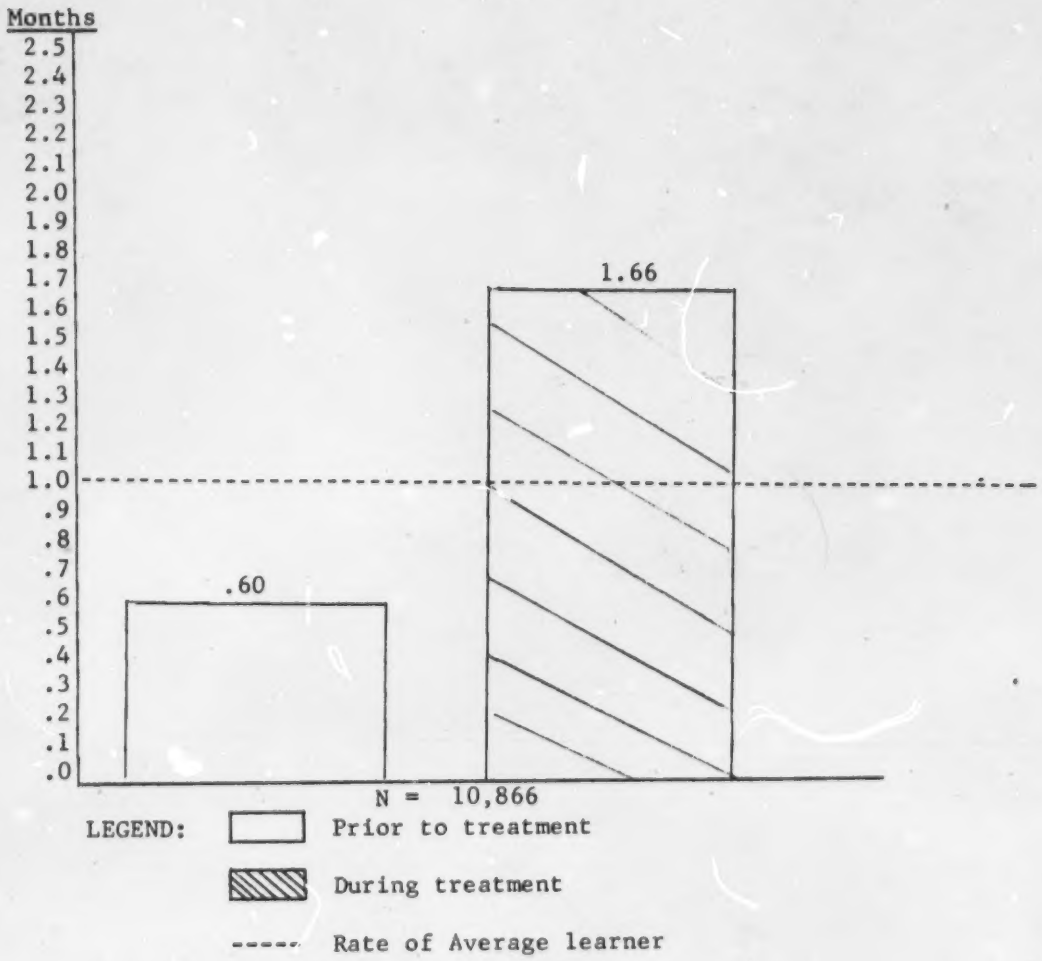


Illustration 8

New York City Secondary Mathematics
Combined Public and Nonpublic Groups Rate of Gain
Grades 7-12



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CHAPTER IV

PROJECTS WITH PROMISING ACTIVITIES

The apparent phenomenal growth of educationally disadvantaged youngsters in some project activities is a signal to decision makers. Remedial treatments wherein exceptional student achievement occurred and reasonable costs were associated with the facilities, staff, and materials are cited as promising activities for replicating in similar situations.

Requirements for Nomination

In New York State the search for such activities in compensatory education project involved checking pupil achievement against several standards. The process of isolating promising activities involved the following:

1. The pupils must have been selected for the treatment on a score taken at a different time from when the pretest score was obtained. This phase of needs assessment reduces some apparent achievement associated with the regression to the mean evident at the tails of a distribution.

2. The activities selected for citation must be in districts that have comparable districts elsewhere in the State. Since the largest part of New York State's ESEA Title I monies are directed toward large urban districts, promising treatments in high total cost projects with reasonable per pupil expenditures are particularly attractive. Large groups permit greater confidence when interpreting results and remove the likelihood of encountering results influenced by one extraordinary teacher or similar nonrepresentative treatment factors. However, many smaller districts contain comparable learners and examples of promising activities from these districts are also reported here.

3. Measures of effectiveness must be both statistically and educationally significant. That is, real differences in means must be established and the magnitude of the growth may be professionally recognized as substantial by people from appropriate disciplines.

4. The individual pupil performance prior to entering the activities as well as the performance across the supplementary activities must be a simple linear regression wherein a rate of gain prior to treatment is derived from the pretest and an effort is made to estimate the postest in the absence of the treatment. The pupil's posttest score obtained from testing is compared to the estimated posttest score and the differences are tested by means of a correlated t-ratio.

5. The projects must contain specific performance objectives in either reading or mathematics achievement.

Selection

The promising activities selected for this report met the conditions cited above. For interpretation, the growth or data points are presented in grade equivalent units, normal curve equivalents, or percentile ranks and the technical objectives were paraphrased as goals. The pupils generally achieved one month growth or better for each month of the supplementary activity in either reading or mathematics.

Summary

It may be interesting to note that most of the reading and mathematics activities nominated were "pull-out" treatments where segments of the target population were taken from regular classes and treated spearately for specific deficiencies. The practice of removing pupils from the regular classroom had been questioned because of a potential communications breakdown between the special Title I staff and the regular classroom teacher. The project directors indicated that a special effort (including a conference mechanism among staff) had been made to avoid gaps in communication between the classroom staff and the staff of the Title I treatment size.

Each of the promising activities shared the emphasis on a specific skill diagnosis followed by a prescription, similar to the medical model. Frequently, a specially trained diagnostician would diagnose and prescribe, with their prescription being carried out by a subject matter specialist and/or paraprofessional. A different set of activities was prescribed for each participant.

The treatments reported here shared the conditions of diagnosis and prescription and physical removal of pupils from the classroom to a special remedial center although the organization for delivering instruction at those centers varied as the districts.

Title of Project: Diagnostic Reading Program

Location: New York City Community School District #18

Budget: $229,560 Grades: 2-6

Cost/Participant: $575 Participants: 400

Major Goal: The total reading scores of the participants were to show a statistically significant ($p \leq .05$) difference between the predicted posttest and obtained posttest means as calculated by grade equivalent units taken from the California Achievement Test.

Background: The Diagnostic Reading Center approach has been in force for several years. Participants in fifth and sixth grades generally were reading at a third grade level or below. Early in the 1970's this district installed an Instructional Support System (a criterion referenced test procedure) which identified individual pupil skill deficiencies and objectives appropriate for remedial instruction. Consistently, the district has demonstrated impressive achievement in the reading centers following prescriptions tied to the identified deficiencies.

Activities: Groups of 10 to 15 children were scheduled for 4 to 5 periods lasting 40 minutes each at one of 4 centers. The 5 reading teachers and 10 educational assistants determined the reading problems of individual children, developed and executed skill related tasks, and participated in an intensive week-long training session oriented toward diagnostic and prescriptive reading techniques.

Findings: The combined reading scores for 357 participants were collected in October 1976 and May 1977 from the administrations of the California Achievement Test. The pupils were expected to achieve slightly more than three grade equivalent months in the seven month period between test administrations. The pupils averaged ten grade equivalent months in the seven-month interval.

Title of Project: Mathematics High Intensity Learning Centers

Location: New York City Community School District #15
Brooklyn, New York

Cost: $752,357 Grades: 3-6

Cost/Participant: $423 Participants: 1,780

Major Goal: The total mathematics scores of the students were to show a statistically significant ($p < .05$) improvement between the pretest and posttest as calculated with normal curve equivalents taken from the California Achievement Test.

Background: This treatment, first implemented in 1973-74, has been expanded from 4 school building to 18 buildings. Teacher-managers prepared prescriptions that were executed in pull-out laboratories by support staff and reinforced during regular classroom instruction. Repeatedly, the findings have been positive over the years.

Activities: Twenty classroom management system laboratories were constructed so that separate learning spaces (carrel and semi-barrier privacy areas) were located near various material centers (cassette recorder areas, calculator areas, manipulative material area, gaming area). Individual pupil prescriptions using materials from over 30 publishers were tied to approximately 500 mathematics objectives. Pupils received supplementary instruction for about 120 minutes per week over and above 140 minutes in the regular classroom. Criterion referenced test items were periodically administered to confirm the acquisition of skills.

Findings: The California Achievement Test was administered in October 1976 and May 1977 to pupils selected onthe basis of scoring below the 24th percentile on the Stanford Achievement Test (Mathematics battery) in May 1976. The analysis via the U.S.O.E. norm-referenced model provided a basis for estimating no growth above an expectation in the absence of ESEA Title I intervention. A positive difference of 7 normal curve equivalent (NCE) units between a pretest and a posttest were considered to be an accepted standard of noteworthy achievement. At the 3rd grade level, 420 pupils increased the average position from the 29th percentile rank to the 31st percentile rank for the median pupil. A gain of 10 NCE units was observed for 620 4th grade pupils, 550 5th grade pupils, and 60 6th grade pupils. The improvement represents a change from the 14th to the 29th, the 10th to the 21st, and the 9th to the 19th percentile rank for the median child in the 4th, 5th, and 6th grades, respectively. This magnitude of achievement was consistent with previous year's findings.

Title Of Project: Diagnostic/Prescriptive Mathematics Program

Location: New York City Community School District #24
Queens

Budget: $68,340 Grades: 4 & 5

Cost/Participant: $683 Participants: 101

Major Goal: The total mathematics scores of the students were to show a statistically significant ($p < .05$) improvement between the protest and posttest as calculated with normal curve equivalent units taken from the Stanford Achievement Test.

Background: The test-teach-test treatment has been in force for 2 years. Remedial mathematics centers, staffed by a mathematics specialist, provided mathematics skills and concepts in a logical succession of eleven content strands at nine levels of difficulty for each strand. Unit mastery posttests have been employed consistently to confirm skill acquisition (or deficiency) so that pupils have not been directed toward more difficlut concepts until competency at lower levels of difficulty was certified. A cummulative deficit was arrected with this treatment approach.

Activities: The treatment depended upon a comprehensive diagnostic and placement phase followed by a prescriptive implementation phase. Four groups of 12 pupils each met for a one hour session five times per week. Instructional materials were available for individual use in remedial units for numeration, addition, subtraction, multiplication, division, fractions, applications, money, time measurements and geometry. Pupils work on specific prescriptions in mathematics skill folders.

Findings: The Stanford Achievement Test, Mathematics Battery was administered according to the procedures specified by the U.S. Office of Education Model A. The total mathematics score average increased by eight NCE units, an improvement comparable to having the median participant score move from the 14th to the 24 th percentile rank.

Title of Project: Remedial Reading Project for Educationally Disadvantaged Children

Location: Schenectady City School District

Budget: $182,664 Grades 2-6

Cost/Participant: $387 Participants: 472

Major Goal: The students were expected to demonstrate a significant increase in reading achievement on the posttest administration of the Stanford Achievement Test Reading Battery beyond the achievement anticipated without ESEA, Title I services.

Background: The Schenectady school district employed a district-wide basal reading program. The remedial teachers coordinated the supplementary treatments with the classroom teachers so that particular deficiencies were corrected or regular classroom efforts were reinforced.

Activities: The remedial treatments were conducted in separate facilities from the regular classroom for periods lasting from 15 to 35 minutes per day, three to five times per week. The commitment was to a linguistic approach where commercial language experience readers and linguistic reading programs were commonly employed.

Findings: In the eight months between Stanford Achievement Test administration, the tested target population of 423 pupils was expected to achieve nearly four months. Instead, an average of 12 months achievement across the five grades was realized.

Title of Project: Reading Program for Disadvantaged Children

Location: Valley Central Schools of Montgomery

Budget: $103,968 Grades: 2-6

Cost/Participant: $304 Participants: 342

Major Goal: The grade equivalent rate of reading growth as measured by the Stanford Achievement Reading Tests during treatment was to exceed the historical rate of growth.

Background: The district had implemented the remedial reading approach during the previous year. The estimated achievement across eight months in grades two through six was about four and one-half months in grade equivalent units. The observed gain averaged about 13 months as measured by standardized achievement Tests. Building principals exercised a great deal of the supervision for the treatment installation. The pupils in grades four and five in the ESEA, Title I reading treatment several years previously had failed to exceed the rated predicted without compensatory intervention. The prior treatment was replaced by the effort cited here. The treatment was not cited for at least one year so that the Hawthorne effect could be considered and rejected.

Activities: Trained reading teachers, ass isted by paraprofessionals instructed pupils on a one-to-one basis or in groups of less than eight pupils. Each pupil's parents or guardian participated in a conference once the diagnostic phase was completed. Instructional materials for pupils in grades two and three were often phonics-related while the materials for grades four and five were more often comprehension-related. Every target pupil received 30 minutes per day supplemental instruction from an ESEA, Title I reading teacher every day. Those students designated as needing additional reinforcement received an additional 15 to 20 minutes from one to four times per week from a paraprofessional.

Findings: During the eight months that elapsed between the pretest and posttest administrations, 330 pupils were expected to achieve about four months growth in grade equivalent units. However, the posttest analysis revealed that the pupils had achieved about 12½ months growth. This finding was consistent with the finding from the previous year in the ESEA, Title I project.

Title of Project: Uplift Mathematics

Location: Copiague

Budget: $137,116 Grades: 3-8

Cost/Participant: $332 Participants: 413

Major Goal: Each grade was expected to show a significant improvement ($p < .05$) in the mean rate of growth in mathematics over what would have been expected from regular classroom instruction alone as measured by the Califronia Achievement Test Mathematics Battery.

Background: The project has been in force for twelve years. Continuously, the delivery system of mathematics services has been refined and improved. Overall, small group and individualized instruction was organized for specific deficiencies. The district has a force of regularly trained volunteers who essentially tutor target pupils.

Activities: Pupils who scored below the 23rd percentile on the administration of a commercially prepared norm-referenced mathematics test participated in supplementary instruction for 30-40 minutes per day for 3 to 5 days per week depending upon the magnitude of the mathematics deficiency. The work stations varied from areas within the regular classroom to areas in other designated sites (library, empty classrooms). The staffing was primarily through additional helping fortified by paraprofessionals. Pupils concentrated on exercises designated to promote increased computation skills and improved solving abilities.

Findings: During the seven months that elapsed between pretest and posttest administration approximately six months growth for each month of instruction was anticipated based upon the pupils past rate of achievement. The 371 participants for whom both a pretest and posttest were available achieved an average of 1.7 months growth for each month in grade equivalent units across the treatment period.

Title of Project: Mathematics Resource Teachers

Location: Newburgh

Cost: $151,639 Grades: 3-6

Cost/Participant: $347 Participants: 437

Major Goal: The participants were expected to achieve beyond expectation at (p .05), hisortical regression design, as measured by the Stanford Achievement Tests in Mathematics.

Activities: For those pupils with limited mathematics concepts, remedial work with manipulative materials was designed to develop concepts from actual experiences. A major portion of the activities involved drill in computation skills. Each mathematics resource teacher met with six groups each day for 30 minutes per group. Each group met for 5 periods each week with approximately 10 participants in a group. The mathematics resource teachers worked cooperatively with the classroom teachers for one additional period per day in the classroom.

Findings: The 340 participants for whom both a pretest and posttest were available had progressed at a rate of approximately .7 of a month growth for each month of classroom instruction prior to the supplementary treatment. During treatment the pupils achieved nearly 2.7 months growth for each of the nine months elapsing between the pretest and posttest administrations.

Title of Project: Remedial Math Labs

Location: Niagara Falls

Budget: $250,962 Grades 3-7

Cost/Participant: $554 Participants: 453

Major Goal: The grade equivalent rate of mathematics growth as measured by the Comprehensive Test of Basic Skills during treatment was to exceed the pupils historical rate of growth.

Activities: The remedial mathematics laboratories were installed in seven target schools. The emphasis was placed upon basic computational skills. A review of number systems, counting and decimal place value preceded exercises with the operations of addition, subtraction, multiplication and division. The computational aspects dealt with whole numbers, common fractions, decimals and percentages.

The laboratories were in session for eight 30-minute periods per day and served 40 educationally disadvantaged pupils per center. Pupils who had to attend the Mathematics Laboratories at least 3 times per week were assisted by one Math Lab teacher and one Math Lab aide. Two circuit-riding mathematics resource teachers advised the lab teachers of methodological approaches to address certain deficiencies and facilitated communication of progress in selected areas with the regular mathematics classroom teacher.

Findings: The 424 participants had been progressing at a rate of .5 of a month for each month of instruction prior to the compensatory treatment. During treatment the participants achieved 1.9 months growth per month across the treatment.

Title of Project: Reading Center

Location: Utica City School District

Budget: $83,494 Grades 2-6

Cost/Participant: $218 Participants: 383

Major Goal: The target population was expected to demonstrate a higher grade equivalent average in reading on the posttest than would have been expected without ESEA, Title I intervention.

Background: The district has participated heavily in special reading projects (Project Alert, Right-to-Read) sponsored by the Education Department in recent years. Different degrees or types of reading deficiencies receive different delivery systems of service. The systems include a reading center, a support staff supplement team and a diagnostic/remedial clinic. The per pupil expenditure at the clinic is $477; at the center is $218; and through the supplement team, is about $185.

Activities: All three approaches depend upon individual pupil skill deficiency identification. The reading center approach serves each child three times per week for one-half hour per session. Some participants receive direct instruction from corrective reading teachers while others have commercially prepared programmed materials monitored by paraprofessionals after the teachers have selected the prescription.

Findings: The California Achievement Test Reading Battery was administered in late September 1976 and May 1977. Scores from 356 pupils in grades two through six at the reading centers were analyzed in such a way that a predicted posttest average was obtained for each grade. About 3½ months growth in grade equivalent units in the 8 month period between tests was expected without ESEA, Title I intervention. The reading center participants averaged about 1⅞ months growth in the 8 month period.

Title of Project: Operation ETA

Location: South Country Central School, East Patchogue, Long Island

Budget: $159,947 Grades: 4-6

Cost/Participant: $521 Participants: 307

Major Goal: The total reading scores of the students were to show a statistically significant ($p < .05$) improvement between the pretest and posttest as calculated by grade equivalent units taken from the Metropolitan Achievement Test.

Background: The intermediate grade laboratory intervention system had been in force the previous year, with the findings being relatively positive but not outstanding. When the district increased the number of reading aides, the achievement increased dramatically.

Activities: The treatment was installed as a laboratory (pull out) approach where a reading specialist provided prescriptions, materials and methods for the aides to implement. The students scoring in the third stanine and below on the Spring 1976 Standardized Test were treated individually or in small groups of less than 5 pupils. An individual record keeping operation that indicated the objectives mastered from the district's monitoring system provided a trail of accomplishments and future goals. Both the regular classroom teacher and remedial staff plan and work from the pupil record folders.

Findings: The Metropolitan Achievement Test, Reading Battery was administered close to the norming dates. An empirical estimate was calculated from the pupils fall pretest scores to predict the probable performance level in the spring in the absence of the ESEA, Title I treatment intervention. The participants were expected to achieve five months across an eight month interval between tests based upon their prior rates of achievement. Instead, while participating in the reading laboratories, the pupils achieved about 11½ months growth in the eight-month period.

CHAPTER V

SUMMARY

Two priority areas designated for instruction were reading and mathematics. Superimposed across all projects employing norm-referenced tests (so that comparable data leading to programwide inferences could be derived) was the question: Did each treatment group demonstrate achievement beyond expectation(based upon the pupil's own past performances)? The local education agency subjected the pretest scores to a regression equation that estimated where the target population might place at the posttest in the absence of Title I services. A comparison of the obtained posttests was made with the estimated posttests by means of an inferential statistic so that real differences would be detected. Where historical data did not exist, the difference between pretest scores a nd posttest scores was subjected to inferential analysis.

Where the scores of the participants in READING and mathematics were from samples with appropriate test data, generalizations to the total treatment groups have been avoided. Only scores of pupils who had a pretest and posttest were included in the district-prepared analyses subsequently aggregated by the State. Such data indicated that pupils in remedial treatments either moved closer to the average (less disadvantaged) pupil's performance or accelerated their rates of growth concurrently with participation in district-designed ESEA, Title I projects.

. . . In remedial reading projects, over 49,000 upstate and 95,000 New York Title I participants began to achieve at a rate of at least one month gain for each month of Title I treatment.

. . . In remedial mathematics treatments, nearly 21,200 upstate and 37,600 New York City pupils who have previously learned at an average rate of half that of advantaged pupils achieved almost 1.5 month gain for each month in ESEA, Title I supplementary services.

The interpretations of the findings do not permit evaluators to claim that the ESEA, Title I program in New York State was an unqualified success. For example, pretest or posttest scores were unavailable for 8,100 mathematics participants and 21,600 reading participants. Thus, judgements about these pupils' progress could not be made.

Overall, the data indicated that in excess of 202,000 upstate and New York City educationally disadvantaged project participants who were consistently meeting failure in the basic skills areas were diminishing the distance between themselves and the norm by which they were being judged. In other words, while participating in the regular classroom and in supplementary services, the participants demonstrated the capacity to achieve at higher rates of growth than without the ESEA, Title I basic skills remedial activities. Districts, judiciously expending ESEA, Title I monies in New York State, again demonstrated that given supplementary resources, positive changes in pupil behavior in the basic skills areas (beyond the growth expected in the absence of funded projects for disadvantaged learners) can be brought about on a massive scale.